Town of Lexington
Department of Public Works
Engineering Division

January 22, 2016

This memo is to serve as a response to questions that were left unanswered at the meeting of January 19th as well as additional information as a point of clarification on questions that were outstanding and to provide clarification on other issues.

Responses to unanswered questions from the January 19th meeting

What is the shape/type of the newly designed circle behind Diamond Middle School?

The intersection of Burlington Street, Hancock Street, Hamilton Road, and North Hancock Street at Diamond Middle School is considered to be a modern roundabout.

Is there a possibility of traffic lights only operating during the peak/busiest traffic periods?

It is not recommended to turn a traffic signal completely off or put in to a "dark mode" at any hour of the day. When a signal is in "dark mode" it is most commonly associated with a power failure and the intersection is left without any traffic control. Typically if a traffic signal is to function differently during an off-peak period, it is placed into a flashing mode, where main approaches receive a flashing yellow indication and secondary approaches receive a flashing red indication.

If traffic signals were installed in these locations, they would be fully actuated. In a fully actuated signal, the main line (Massachusetts Avenue in this case) will remain green at all times until a vehicle from the side street (Pleasant Street or Maple Street) is detected, at which point they will be given a green light and the opportunity to turn on to Massachusetts Avenue. The light would then go back to green on Massachusetts Avenue for as long as no cars approach on the side streets.

How will the work impact cut through traffic on Follen Road?

The issue of cut through traffic is being reviewed by a separate consultant. Conceptual ideas are being developed to address this issue and will be available soon. The initial findings from the consultant is that the existing condition cut through will be alleviated for most of the areas of concern. The reduced delays on the main lines encourages the users to stay on the main lines.

Under what conditions would signalization be preferable to roundabouts?

The use of signalization over a roundabout is dependent on multiple factors including:

1. ROW Impacts – when there is no room to build a roundabout.
2. When there are unbalanced traffic volumes, where one or two approaches have very heavy volume compared to the volume of other approaches.

3. When there are frequent major swings in traffic volume. For example, letting traffic out of a stadium, parade or other local events. Traffic signals are more flexible and can be made responsive whereas roundabouts are static and cannot be adjusted based on short or long term changes.
4. For visually impaired and elderly persons, traffic signals offer more predictable stop and go pedestrian indications and protected crossing times when compared to roundabouts.
5. When a multilane roundabout is required due traffic volumes but there is also heavy pedestrian volumes at the location.

Has the town thought of the signal jobs in terms of one large impact?

If all the proposed traffic signals are installed between Woburn Street and Pleasant there will be 4 added signals. The Maple Street and Pleasant Street intersections are spaced approximately 2,500 feet apart and should not impact each other. Maple and Marrett are approximately 600 feet apart and coordination should and will be considered if installed. Additionally, if a signal was installed in the town center at Woburn Street, this location would be approximately 4,800 feet from Marrett Road, and would therefore not be effected by each other.

Could the town facilitate a neighborhood feel rather than facilitate traffic?

The East Lexington neighborhood and Historic District have been a major consideration throughout the process of this project. This project was initiated by direct abutter's concerned about safety. The goals of the project is to not to facilitate regional traffic.

Have multiple roundabouts in series been analyzed with the potential of three roundabouts between Pleasant Street and Town center?

With the potential roundabouts at Pleasant Street and Maple Street being spaced approximately 2,500 feet apart, it is anticipated that they would have no effect on one another. Additionally, if a roundabout was installed in the town center at Woburn Street, this location would be approximately 1 mile from Maple Street, and would therefore not be affected by the chosen solutions within the East Lexington area.

Follow up information and points of clarification

How is this project funded?

This project is listed as a TIP (Transportation Improvement Project) with MassDOT. Under TIP projects municipalities are responsible for payment and management of the design as well as the right-of-way (ROW) acquisitions. The state is responsible for paying for the construction.

Will the state still pay if we add costs by approving roundabouts?

If the town desire is to build one or more roundabouts then we need to bring the designs to MassDOT for approval. If they approve of the design change then we will request the additional funding for the project from MassDOT. MassDOT will evaluate and determine if they approve

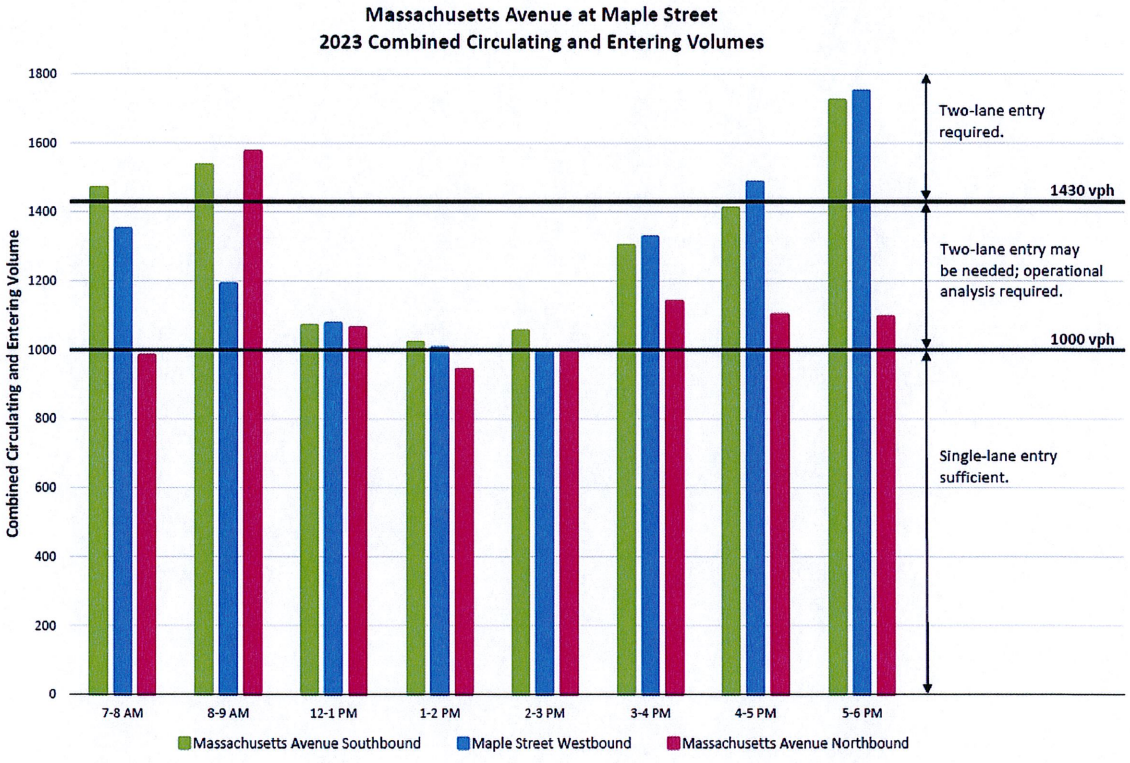
of this request and determine if the funding is available with the current TIP year or if the project would need to be delayed to a different year.

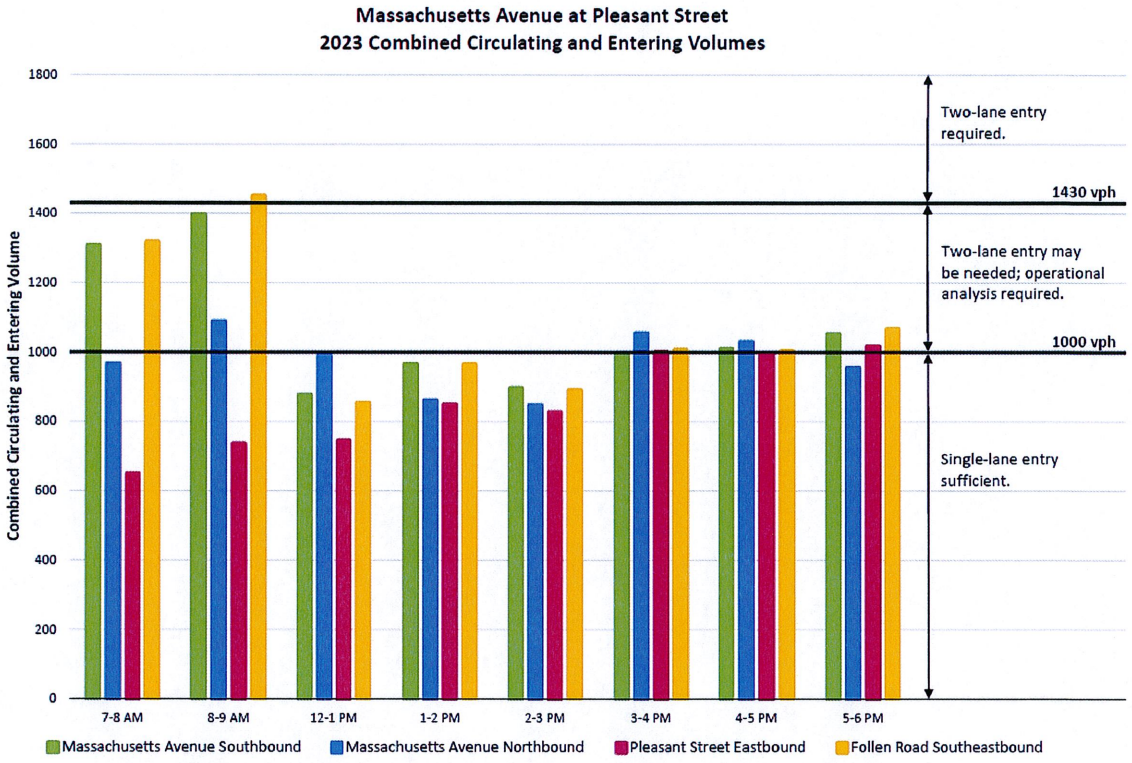
Who pays for the right-of-way acquisitions?

The town is responsible for paying for all acquisitions. The language has been approved previously from Town Meeting but a funding request is in for the annual town meeting. If there is a selection of one or two roundabouts then the funding request will be adjusted up to accommodate for the additional cost for the ROW necessary to construct the roundabout. The current signal design shows temporary easements only. The roundabouts would also require temporary easements; in addition to the temporary easement permanent takings would be needed as well. The details can be found on the presentation slides from the 19th.

Is the peak hour just one-hour in the morning and one-hour in the afternoon?

The term 'peak hour' defines the heaviest volume hour for the morning and afternoon peaks however there is a span of time both before and after this 'peak' with considerable traffic that impacts the design and recommendation for lane numbers and configurations. We have provided some graphs showing the circulating and entering volumes for both intersections as seen below;





What is needed for signage at the Pleasant Street roundabout?

A member of the Historic Districts commission has asked about the signage that is anticipated at pleasant Street under the roundabout proposal. Following the Manual of Uniform Traffic Control devices (MUTCD) we have put together graphics for both the roundabout and signal alternatives at this location as seen on **attachment 1**;

Signage would be similar at the Maple Street location with some additional signage at the HAWK or RRFB locations.

What are the on-street parking impacts to parking under the two scenarios at Pleasant Street?

Within the vicinity of the Pleasant Street intersection, the existing condition currently allows no parking. The roundabout alternative will not increase or decrease parking within the intersection. The signalized alternative will allow the opportunity for 12 additional permanent parking spaces on Massachusetts Avenue and Follen Road as well as 2 to 3 time-restricted parking spaces (Sundays only) on Massachusetts Avenue.

The following table shows the increase in parking spaces under each scenario at the Pleasant Street and Massachusetts Avenue intersection.

Parking Spaces		
Existing	**Round-about**	**Signal**
0	0	12

*Intersection Area includes Mass Ave (Sta. 14+00 to 18+50),

Follen Road (From Pleasant Street to Project Limits).

What are the impacts to total impervious surface under the various scenarios?

The following table displays the total impermeable surface (pavement and sidewalks) comparisons at each intersection. At Maple Street, the roundabout alternative increases the total impermeable surfaces by 33% while the signal alternative decreases the impermeable surface by 10%. At Pleasant Street, the roundabout alternative increases the total impermeable surfaces by 6% while the signal alternative decreases the impermeable surface by 4%.

Total Permeable Surface Comparison

Maple Street					
Existing		**Roundabout**		**Signal**	
Pavement	Sidewalk	Pavement	Sidewalk	Pavement	Sidewalk
31,000	5,000	35,150	12,750	28,700	3,800
TOTAL=	36,000	TOTAL=	47,900	TOTAL=	32,500
		33%	Increase	-10%	Decrease

*Areas (SF)

Pleasant Street					
Existing		**Roundabout**		**Signal**	
Pavement	Sidewalk	Pavement	Sidewalk	Pavement	Sidewalk
29,250	3,650	26,200	8,550	27,000	4,600
TOTAL=	32,900	TOTAL=	34,750	TOTAL=	31,600
		6%	Increase	-4%	Decrease

*Areas (SF)

What happens to the pedestrian crossing at Follen Church if we install a roundabout at Pleasant Street?

The pedestrian crossing at Follen Church is beyond the limits of either the roundabout or traffic signal scenarios. Several treatment options are under consideration that will work independent of what is decided upon at the Pleasant Street intersection.

What do HAWKs and RRFBs look like at a roundabout?

We have attached a few photos from locations that these have been installed that we feel are representative. We would recommend decorative poles at the installation locations. Please note that these photos are NOT meant to represent the size and lane configuration of roundabouts, but to convey the general look of the crossing fixtures and signage. **See attachment 2.** We have asked MassDOT if they would require these on overhead mast arms versus the post-mounted version but have not yet received confirmation on there requirements.

What historic features are impacted at Pleasant Street under the roundabout scenario?

The impacted features are labeled on the plan distributed at the January 19th meeting. We have also taken photos of many of the features to provide a visual as can be seen **attachment 3** and provided approximate lengths of impact to these features. In addition to the items noted on the photos there is also an estimated 5 private trees, 2 private parking spaces (Waldorf property / old general store), and 30 feet of hedge to would need to be removed.

How wide are the sidewalks shown on the plans and what is the width needed if we want a mixed-use path for bike to circumvent the roundabouts?

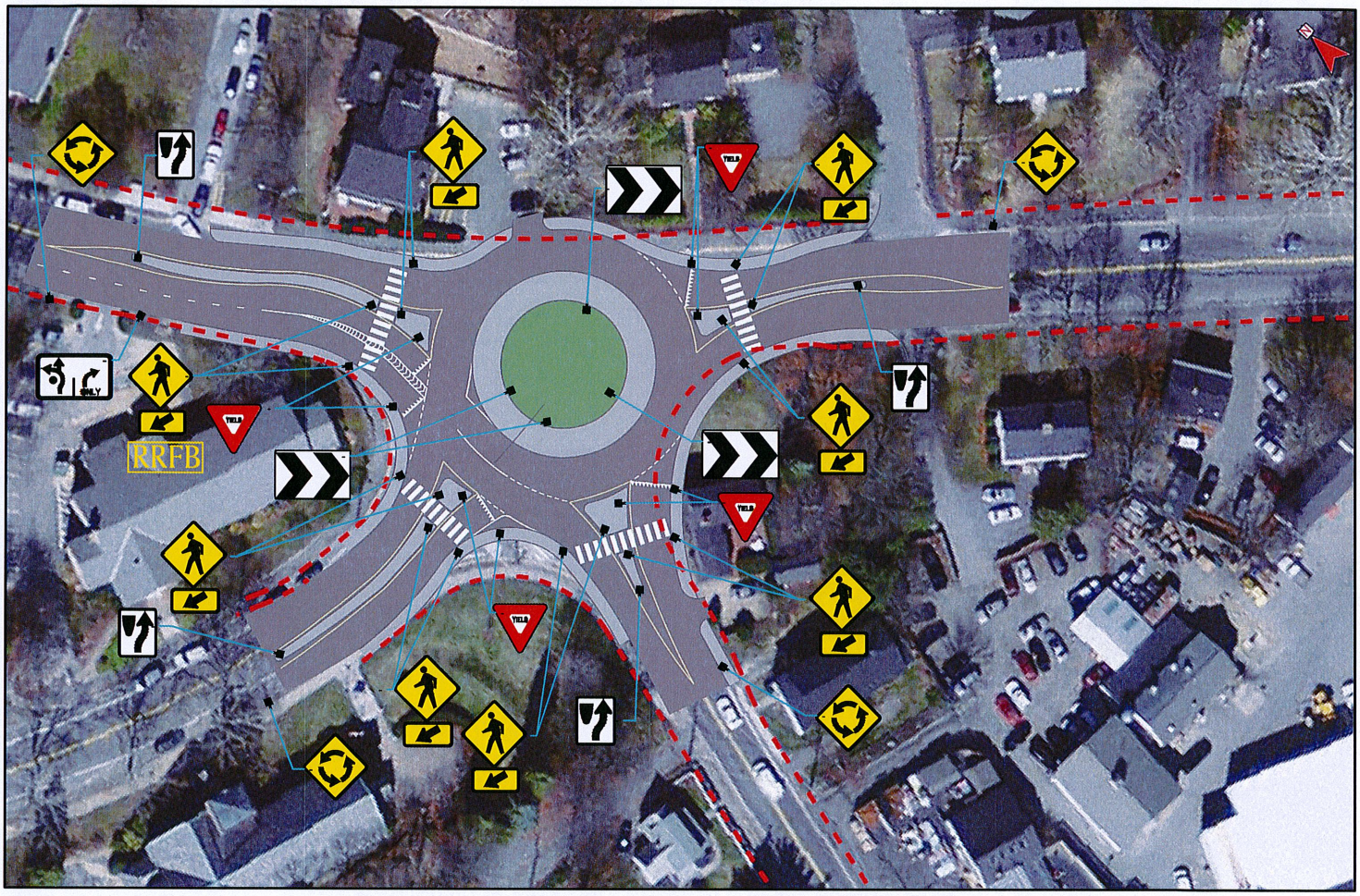
The sidewalks that circumvent the roundabouts on the plans presented are 6 feet in width. If there is a desire to provide an alternative to bikers to get off the road onto a mixed-use path to avoid taking a lane at the roundabout then the width would need to be increased. The minimum width of a mixed-use path is 8 feet and preferred width is 10-12 feet. This would result in increased impacts and may not be feasible at the Pleasant Street entry onto Massachusetts Avenue due to the proximity of the house. The plans currently show the back of sidewalk approximately 2 feet off the side of the house.

Will roundabouts make the cut-through traffic worse than existing and/or worse than the signal proposal?

The signal proposal and roundabout proposal would both have positive effects on the existing cut-through traffic issues as they reduce delays encouraging users to stay on the main line.

Attachment 1

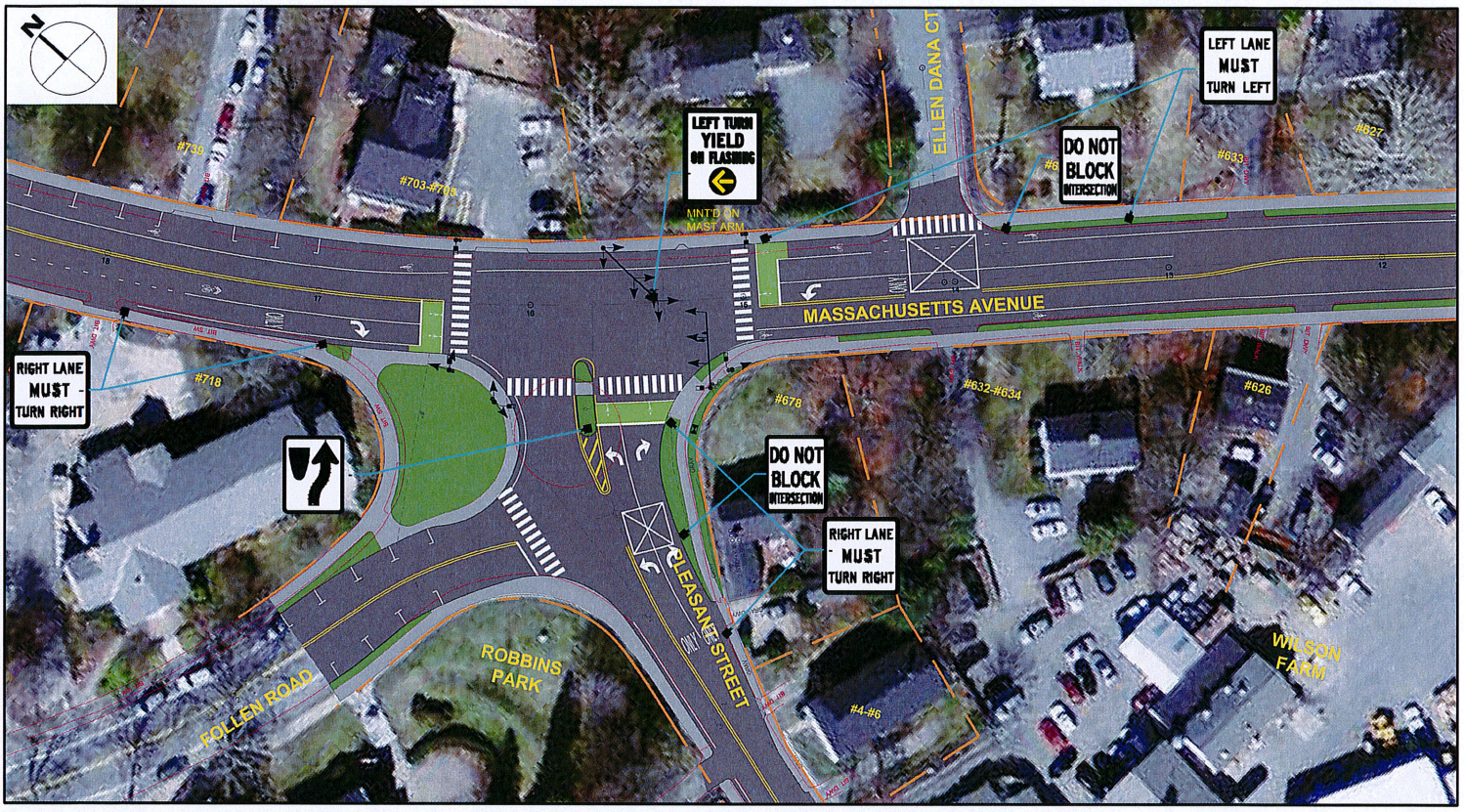
Pleasant Street at Massachusetts Avenue
Multi-Lane Roundabout
Lexington, Massachusetts



Proposed Geometry, Pavement Markings, & Signage

Sign	Description	Qnty
R1-2	Yield	8
R3-8 LT_R	Lane Control Sign	1
R4-7	Keep Right	4
R6-4	Roundabout Arrow	4
R6-5P	Roundabout Ahead	4
W11-2 W15-7pL/R	Pedestrian X-ing	16
Total		37

Pleasant Street at Massachusetts Avenue
Signalized Intersection
Lexington, Massachusetts



Proposed Geometry, Pavement Markings, & Signage

Sign	Description	Qnty
R3-7L/R	Lane Control Sign	6
R4-7	Keep Right	1
R10-7	Do Not Block Intersection	2
R10-12a	LT Yield on Flash Yellow	1
	Total	10

Attachment 2

Sample of a HAWK installation

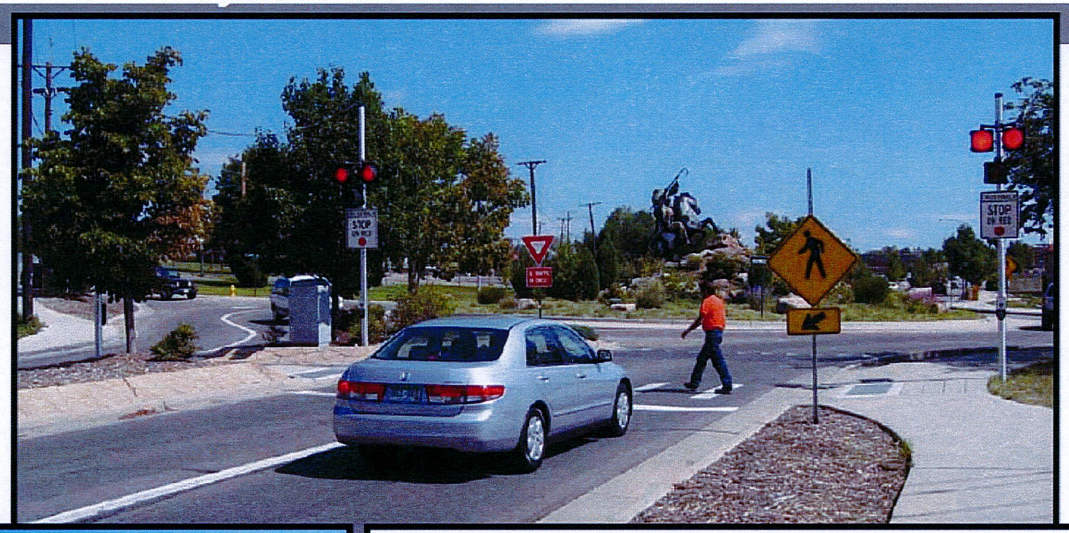
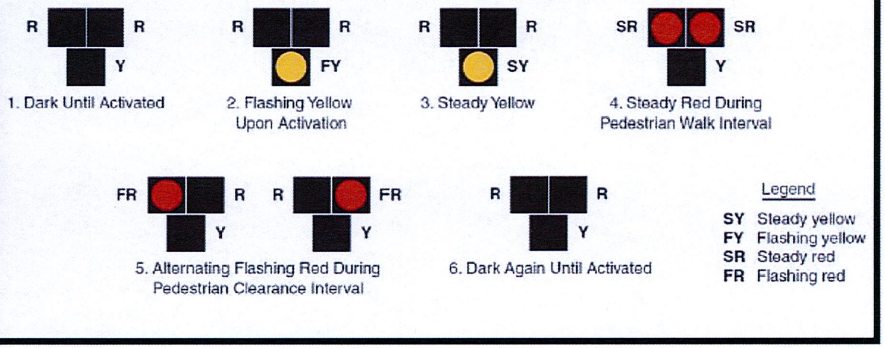


Figure 4F-3. Sequence for a Pedestrian Hybrid Signal



Sample of a HAWK installation

Sample of a HAWK installation

Sample of a HAWK installation

Sample of an RRFB installation

Sample of an RRFB installation

Attachment 3

100 feet of Granite Block wall needs relocation

Southeast quadrant along Pleasant Street

38 feet of fence needs relocation

North side of Mass Ave

16 feet of stone wall to be removed

North side of Mass Ave along parking at Waldorf school property (old general store)